



CRYSTAL QUEST® Thunder Reverse Osmosis

Installation and Maintenance Instructions

MODELS
200 AND 300



CRYSTAL QUEST®
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Made in the USA



STANDARD FEATURES

- 2.5" HF4 Thin Film Composite (TFC) Extra Low Energy Membrane
- 2.5" Champ PVC Membrane Housing
- Aquatec 8800 Booster Pump 110/220 VAC & Transformer
- 5 Micron Sediment Prefilter
- Carbon Block Cartridge
- GAC Polishing Filter
- Wall Mount Bracket
- Solenoid Valve
- 20-40 psi Tank Switch
- Auto-Flush
- Pump Pressure Gauge

MODELS

	Thunder 200	Thunder 300
Design	Wall Mount	Wall Mount
Gallons Per Day	200	300
Nominal NaCl Rejection	98%	98%
Recycle Line	N/A	N/A
Recovery	40% - 50%	40% - 50%
Element Size (in)	HF4 - 2514	HF4 - 2521
Number of Elements	1	1
Feed-Product-Waste	1/4" - 1/4" - 1/4"	3/8" - 3/8" - 1/4"
Pump	1 - 8800 Booster Pump	2 - 8800 Booster Pump
Hertz	50/60	50/60
Voltage (VAC)	110/220	110/220
Dimensions W x L x H (in)	7" x 21.5" x 33"	7" x 28" x 33"
Weight (lbs.)	45 lbs.	50 lbs.

* Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

† Membrane approximate initial capacity based on properly pretreated feed water of 550 PPM TDS as NaCl, 77°F (25°C), Silt Density Index below 5, and 60 psi feed pressure while supplying water to atmosphere. Productivity will vary depending on the feed water conditions.

OPERATING PARAMETERS

Maximum Temperature	110°F (45°C)
Minimum Feed Rate	0.3 GPM @ 30 psi
Minimum Feed Pressure	30 psi
Maximum Operating Pressure	120 psi
Maximum TDS	1000 ppm
Maximum Hardness	<15 Grains
Maximum Turbidity	<1 NTU
pH Range	4-11
Maximum Chlorine Tolerance	0 ppm
Maximum SDI	<5

GENERAL INFORMATION

Your commercial reverse osmosis (RO) system is a durable piece of equipment, which with proper care, will last for many years. This user's manual outlines operating and maintenance details vital to the sustained performance of your system.

The test results included with your system indicate the performance of the system before it was shipped from the manufacturer's facility. The systems are tested for permeate and rejection based on the following testing conditions: 77°F (25°C), 550 ppm feed concentration, and 60 psi feed pressure.

The systems are designed to run at approximately 100 psi operating pressure. Recoveries for your system can vary between 40 - 50%, depending on your application. **NOTE: IN ORDER TO MAINTAIN THE SYSTEM'S WARRANTY, AN OPERATING LOG MUST BE MAINTAINED.**

MANUAL OVERVIEW

This user's manual has been prepared, in order to provide the operator of the system with information on start-up, operation, installation, maintenance, and troubleshooting procedures.

Please feel free to contact your distributor or dealer with any additional questions that are not addressed in this user's manual.

SAFETY SUMMARY

Safety for the system operator and other personnel should always remain the highest priority. This user's manual does not contain all necessary safety statements needed when operating the reverse osmosis system.

Additional safety statements are included within the user's manual text and are enhanced and defined as follows:

NOTE: INDICATES STATEMENTS THAT PROVIDE FURTHER INFORMATION AND CLARIFICATION.

CAUTION: INDICATES STATEMENTS THAT ARE USED TO IDENTIFY CONDITIONS OR PRACTICES THAT COULD RESULT IN EQUIPMENT OR OTHER PROPERTY DAMAGE.

WARNING: INDICATES STATEMENTS THAT ARE USED TO IDENTIFY CONDITIONS OR PRACTICES THAT COULD RESULT IN INJURY OR LOSS OF LIFE.

READ THIS MANUAL

Prior to operating or servicing the reverse osmosis system, this user's manual must be read and understood in full. Keep it and other associated information for future reference and for new operators or qualified personnel near the reverse osmosis system.

INSTALLATION AND INITIAL STARTUP PROCEDURES (SEE DIAGRAM AND SPECIFICATION CHART)

1. Inspect the system for any damage that could have occurred during shipment. Although our systems have been individually inspected, complete a quick inspection of the fittings, tubing, and other components.
2. Please provide a reasonable amount of space for installation and leave 6 inches of space below the filter housings for ease of maintenance.
NOTE: THE REVERSE OSMOSIS SYSTEM SHOULD BE INSTALLED INDOORS AND IT IS SUGGESTED THAT IT NOT BE IN DIRECT SUNLIGHT OR EXTREME COLD.
3. Connect the 3/8" or 1/4" tube fitting to an incoming water source. The minimum water pressure should be at least 30 psi. The system's minimum operating pressure is 80 PSI, but the optimum operating pressure is 100 psi. **NOTE: DO NOT OPERATE AT A PRESSURE EXCEEDING 125 PSI.** The operating pressure can be increased on the face of the booster pump by turning the hex screw clockwise.
4. Connect the concentrate 1/4" tubing (waste) line to drain.
5. Plug the booster pump transformer into a power supply of 110 or 220 volts.
6. This system has been designed with an auto-flush restrictor. This restrictor automatically flushes the reverse osmosis system for 30 seconds every time it starts up and once every hour when the system is producing water. **NOTE: THE TANK PRESSURE SWITCH WILL SHUT THE SYSTEM OFF AUTOMATICALLY, WHEN THE BLADDER TANK IS FULL.**
7. The sediment filter and carbon must be serviced regularly for optimal performance. The filters and water quality should be checked every two weeks minimum.
8. Dispose of the product water until the conductivity of the product water reaches your desired level. Use any TDS or Conductivity meter to monitor the product water quality. A minimum quality of 96% NaCl rejection is recommended. **NOTE: ANY CHLORINE EXPOSURE WILL DAMAGE THE MEMBRANE PERMANENTLY.**
9. This system has been factory wired and preset with a pressure switch at 20 - 40 psi, which is only to be used with a pressurized bladder tank. If using an atmospheric storage tank, a float switch will be required to turn the system ON and OFF.

MAINTENANCE PROCEDURES

1. Periodically observe the quality and quantity of product water from the system. **NOTE: CHECK THE FEED WATER PRESSURE GOING INTO THE REVERSE OSMOSIS MEMBRANE, A SIGNIFICANT DROP IN PRESSURE COULD INDICATE A FOULED PRE-FILTER.**
2. A 20% increase in TDS when checking the permeate water indicates possible membrane damage and the membrane may need to be replaced.
3. It is suggested that a hand held TDS digital meter is used once per week to monitor the water quality.
4. **NOTE: IF THE TDS OF THE FEED WATER EXCEEDS 1000 PPM OF NA CL, A LARGER FLOW RESTRICTOR SHOULD BE USED TO EXTEND THE MEMBRANE LIFE.**
5. It is important to maintain and/or replace the carbon block regularly since the Thin Film Composite membranes are chlorine sensitive. Irreversible damage will occur with any chlorine present in the feed water. For additional information please review the manufacturer's membrane specification sheets.
6. The product line has a one way check valve installed. The check valve should be checked regularly and replaced if not properly sealing.
7. Keep the feed water temperature above 4°C (36°F). **NOTE: EXTREMELY COLD FEED WATER WILL LOWER THE PRODUCT WATER OUTPUT AND INCREASE PUMP PRESSURE.**

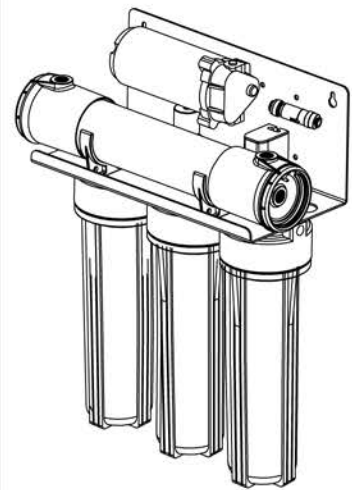
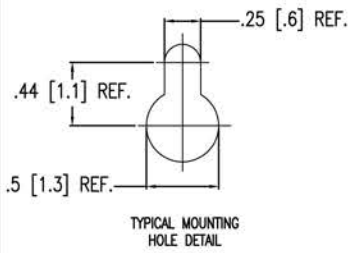
SERVICE ASSISTANCE

If service assistance is required, please complete the following process:

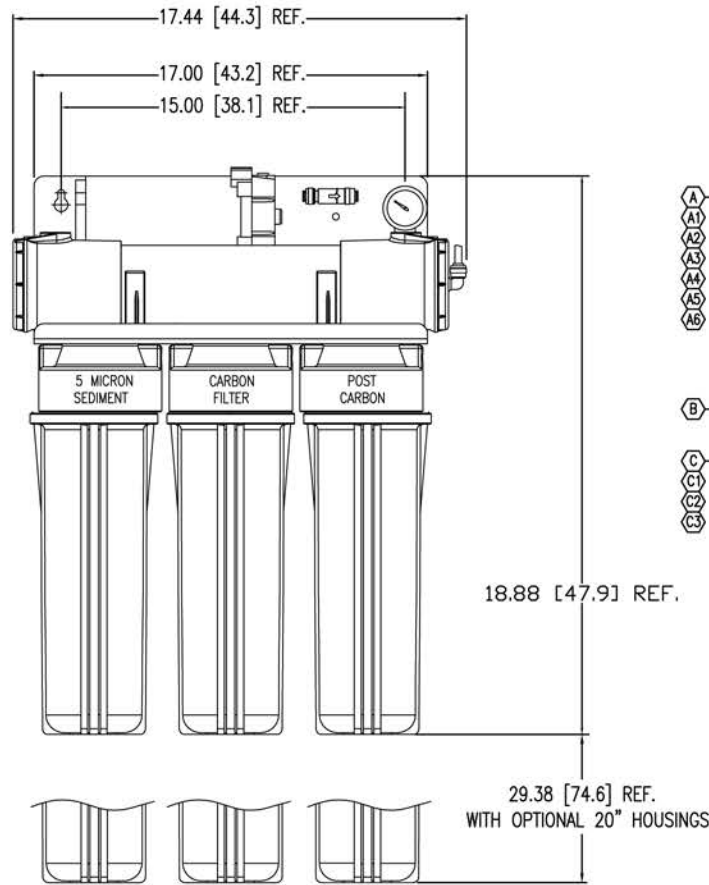
Contact your local dealer or distributor. Prior to making the call, have the following information available: system installation date, serial number, daily log sheets, current operating parameters (e.g. flow, operating pressures, pH, etc.), and a detailed description of the problem.

SYSTEM WARRANTY/GUARANTEE

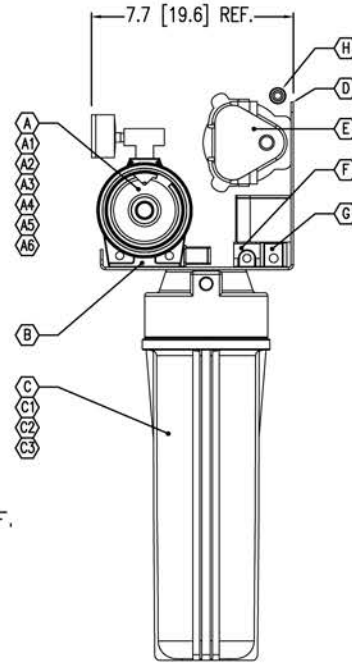
The system's manufacturer guarantees that the proposed product is to be free from any defects in material or workmanship when operated in accordance with written instructions for a period of one year (12 months) from start-up. Parts not manufactured by the system's manufacturer are covered by their manufacturer's warranties which are normally for one year. Please contact your local dealer or distributor for addition information regarding warranties.



ISO VIEW



FRONT VIEW



SIDE VIEW

QTY.	DESCRIPTION	ITEM
1	HOUSING, MEMBRANE, PVC, 2514, 3/8" P X 3/8" C FNPT, CHAMP PART# 200518	A1
1	MEMBRANE, HF4, 2514, ULTRATEC PART# 200386	A2
1	END PLUG, OPEN, GTX, 2.5", 3/8" FNPT, CHAMP PVC PART# 200591	A3
1	END PLUG, CLOSED, GTX, 2.5", 3/8" FNPT, CHAMP PVC PART# 200592	A4
2	SNAP RING, DELRIN, 2.5", CHAMP PVC PART# 200593	A5
1	GAUGE, BKM, NO FILL, 0-200 PSIBAR, 1.5" DIA, 1/8" MNPT, PUROTECH PART# 202436	A6
2	CLAMP, HOSE, STAINLESS, 2.5", SS PART# 200587	B
3	HOUSING, FILTER, WHT/WHT, 2.5" X 20", DBL O-RING, 1/4" FNPT PART# 200723	C
1	CARTRIDGE, SEDIMENT, POLYPRO, 2.5" X 10", 5 MIC PART# 200626	C1
1	CARTRIDGE, CARBON, BLOCK, 2.5" X 10", 10 MIC PART# 200659	C2
1	CARTRIDGE, CARBON, GAC, 2.5" X 10" PART# 200668	C3
1	BRACKET, STEEL, WHITE, TRIPLE, 2.5" PART# 200751	D
1	PUMP, BOOSTER, 8800, 3/8" QC, AQUATEC PART# 200768	E
1	TRANSFORMER, PUMP, 8800, 2 AMP, 220V 50HZ 24VAC, AQUATEC PART# 200770	E1
1	SWITCH, TANK, PRESSURE, 20-40 PSI, 1/4" QC, AQUATEC PART# 200762	E2
1	RESTRICTOR, FIXED, 800 ML/MIN, AUTO FLUSH, 1/4" QC, AQUATEC PART# 200772	F
1	VALVE, SOLENOID, 3/8" COMP, 24V, AQUATEC PART# 200773	G
1	VALVE, CHECK, PVC, 1/4" FNPT X 1/4" FNPT PART# 200963	H

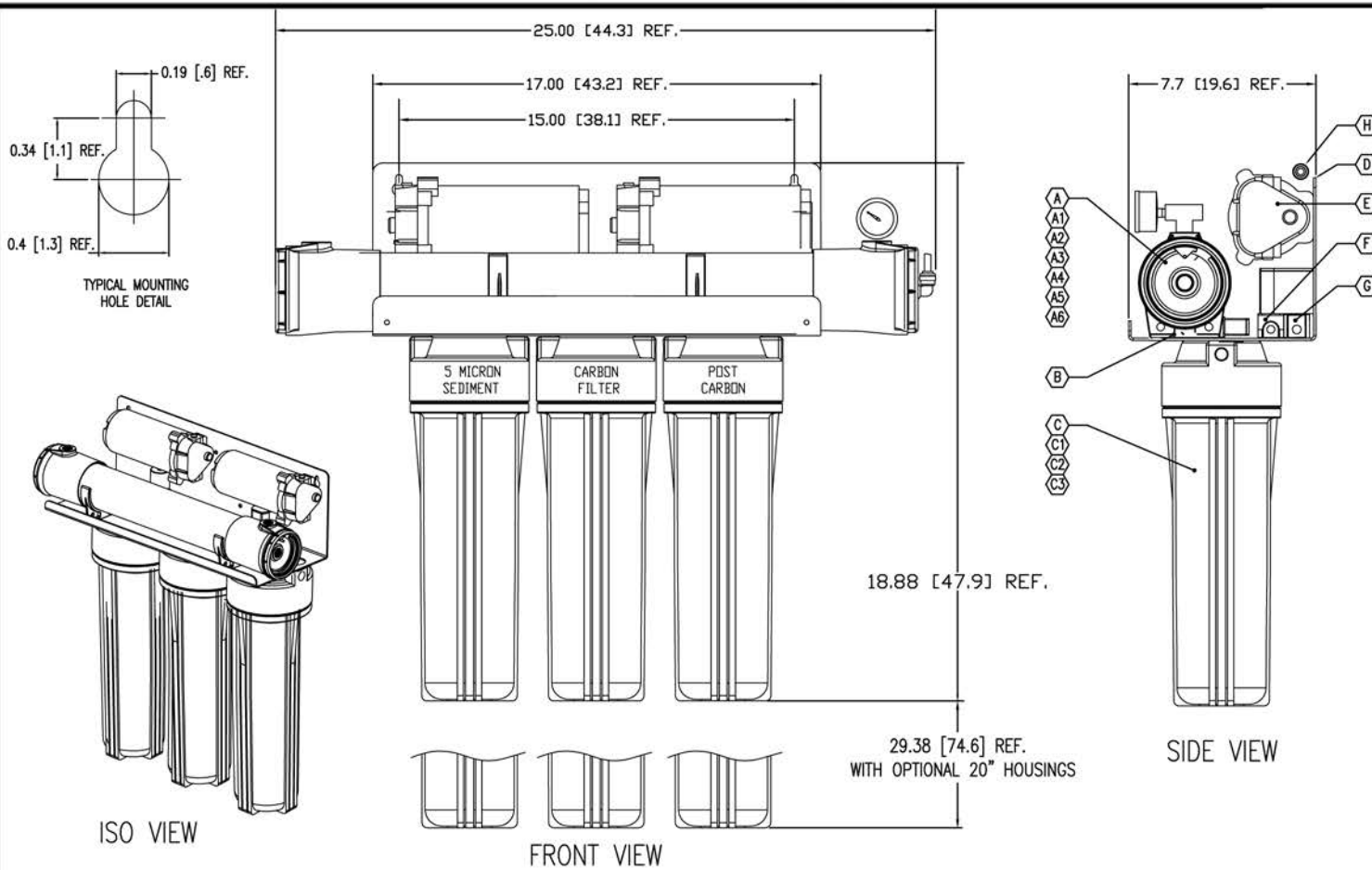
NOTES:

- ALL DIMENSIONS SHOWN ARE GIVEN IN INCHES AND [CENTIMETERS].
- MODEL Thunder 200 is shown
- ALLOW 6.00 [15.2] BELOW SYSTEM FOR SERVICING AND REPLACEMENT OF CARTRIDGES
- PLUMBING CONNECTIONS
FEED: 1/4" TUBE
PERMEATE: 1/4" TUBE
CONCENTRATE: 1/4" TUBE



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Do not scale
drawing



QTY.	DESCRIPTION	ITEM
1	MHS, PVC, 2521, 3/8" SP X 3/8" SP FNPT PART# 200519	A1
1	MEMBRANE, HF4, 2521, ULTRATEC PART# 200387	A2
1	END PLUG, OPEN, GTX, 2.5", 3/8" FNPT, CHAMP, PVC PART# 200591	A3
1	END PLUG, CLOSED, GTX, 2.5", 3/8" FNPT, CHAMP, PVC PART# 200592	A4
2	SNAP, RING, DELRIN, 2.5", CHAMP, PVC PART# 200593	A5
1	GAUGE, BKM, NO-FILL, 0-200 PSI BAR, 1.5" DIA, 1/8" MNPT PART# 202436	A6
2	CLAMP, HOSE, STAINLESS, 2.5" SS PART# 200587	B
3	HOUSING, FILTER, WHT/WHT, 2.5" X 10", DBL O-RING PART# 200719	C
1	CARTRIDGE, SEDIMENT, POLYPRO, 2.5" X 10", 5MIC PART# 200621	C1
1	CARTRIDGE, CARBON, BLOCK, 2.5" X 10", 10 MIC PART# 200658	C2
1	CARTRIDGE, CARBON, GAC, 2.5" X 10" PART# 200668	C3
1	BRACKET, STEEL, WHITE, TRIPLE, 2.5" PART# 200751	D
2	PUMP, BOOSTER, 8800, 3/8" QC, AQUATEC PART# 200768	E
2	TRASFORMER, PUMP, 8800, 2AMP, 110V 60HZ 24VAC PART# 200769	E1
2	SWITCH, TANK, PRESSURE, 20-40 PSI, 1/2" QC, AQUATEC PART# 200762	E2
1	RESTRICTOR, FIXED, 800 ML/MIN, AUTO FLUSH, 1/2" QC PART# 200772	F
1	VALVE, SOLENOID, 3/8" COMP, 24V, AQUATEC PART# 200773	G
1	VALVE, CHECK, PVC, 1/2" FNPT X 1/2" FNPT PART# 200963	H

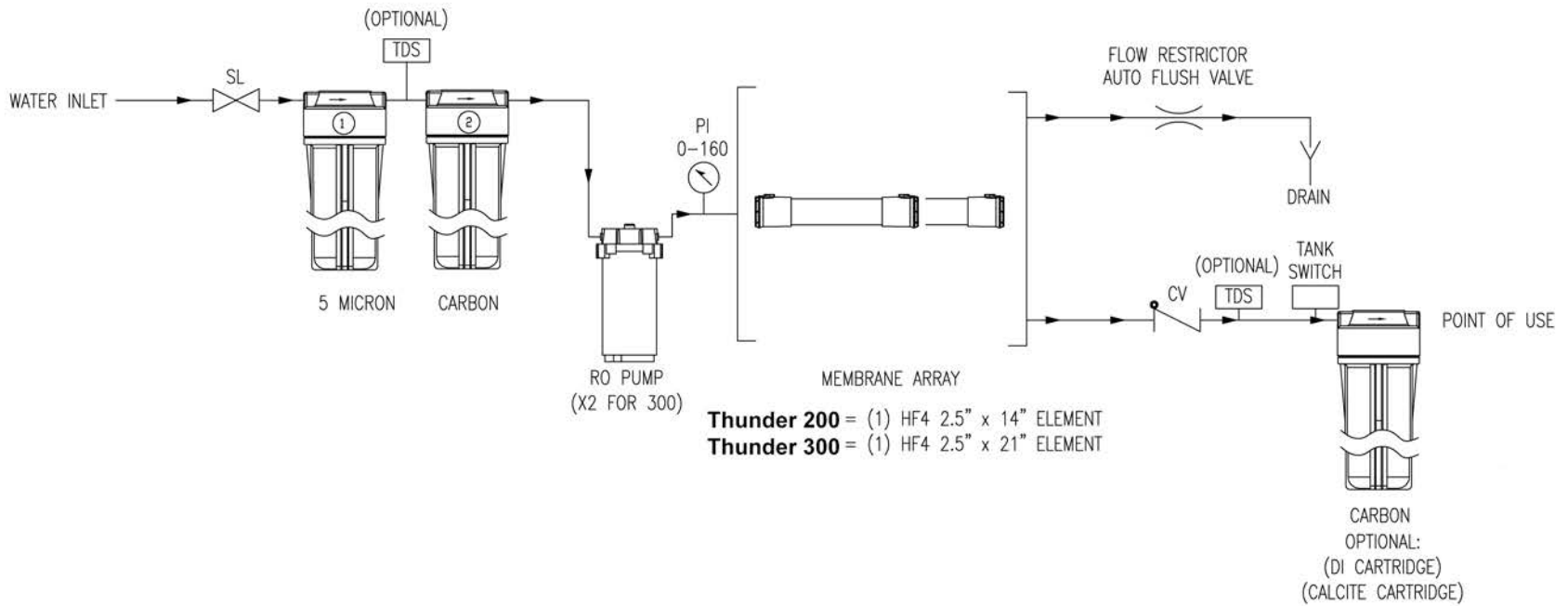
NOTES:

1. ALL DIMENSIONS ARE GIVEN IN INCHES AND ARE [CENTIMETERS].
2. MODEL Thunder 300 is shown
3. ALLOW 6.00 [15.2] BELLOW SYSTEM FOR SERVICING AND REPLACEMENT OF CARTRIDGES
4. PLUMBING CONNECTIONS
FEED: 3/8" TUBE
PERMEATE: 3/8" TUBE
CONCENTRATE: 1/4" TUBE



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SYMBOL LEGEND

 - PRESSURE INDICATOR	 - CHECK VALVE
 - SOLENOID	 TANK SWITCH
 - FLOW RESTRICTOR AUTO FLUSH VALVE	 TDS MONITOR



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drawing**



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KEEP THIS MANUAL FOR FUTURE
REFERENCE AND UNIT MAINTENANCE

Product design is subject to change without notice.

For further assistance contact your
Crystal Quest® Dealer
or visit us at www.crystalquest.com



Authorized Distributor

Should service be required during or after the warranty period or should you have any questions regarding how to use your Commercial Water Purification System, please contact manufacturer's Technical Support Department Monday through Friday, 9 AM to 5 PM Eastern Time, or your authorized CRYSTAL QUEST dealer:



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